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ABSTRACT

This report presents joint committee recommendations for improving the delivery of instruction in Connecticut schools and colleges through the effective coordination and use of educational technology. These recommendations are based on a review of the current use of educational technology in the state and studies by three task forces, who examined computers and instruction, information retrieval and transfer, and instructional television. The recommendations address hardware and software needs as well as individual techniques and delivery systems needed to assure that technology can further the state's educational goals. Individual recommendations are presented in four categories--coordination, information, leadership, and training--and the use of technology is addressed as both a learning tool and a subject of study. The report includes a report on the status of technology in Connecticut and a list of the task force members, who included representatives of elementary and secondary schools, colleges, universities, business, industry, and the general public. (CGD)

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New Directions For Educational Technology

Recommendations of the Joint Committee on Educational Technology

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STATE OF CONNECTICUT 1983

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New Directions

For

Educational Technology

Recommendations of the Joint Committee
on Educational Technology

Connecticut
State Board of Education
Board of Governors for Higher Education

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Preface

Early in 1983 Connecticut's Board of Education and Board of Governors for Higher Education established a Joint Committee on Educational Technology and set in motion the process which led to this report and recommendations. Three task forces, comprised of approximately 50 professionals from elementary, secondary and higher education, business and industry, and staff members from the two education departments, studied the issues pertaining to educational technology. The committee gratefully acknowledges the time and effort of the members of those task forces, whose names are listed in Appendix A.

Following months of study, the Joint Committee completed this report last fall and presented it in November to both boards for their consideration. The report has been modified slightly to respond to concerns raised by board members. It was subsequently adopted by both boards.

The Joint Committee believes this report, *New Directions for Educational Technology*, is a major step in harnessing the strength of technology to improve the entire state system of education. Although some of the recommendations involve relatively long-term goals, the Joint Committee urges both boards and their department staffs to move ahead on many of the recommended actions during the 1983-84 academic year.

New Directions

Connecticut, the nation and the world are being challenged by the explosive growth of technology, particularly in the fields of microcomputers and telecommunications. To date, however, the use of technology in Connecticut elementary and secondary schools, colleges and universities typically has been implemented by discrete, individual efforts. The lack of any broad policy and long-range direction or coordination required for systematic planning has resulted in duplication of effort and inefficiency. Financial support of technological growth in our schools has been sporadic at best. Finally, school and college faculties often have not been prepared for the technological revolution and are now struggling to catch up. These circumstances point all too clearly to the need for vigorous leadership, coordination and direction within Connecticut to manage the state's technological growth with maximum efficiency and responsiveness.

Last year, the Connecticut General Assembly recognized the need for strong leadership and improved coordination by passing Public Act 82-266, An Act Concerning Coordination and Planning for Educational Technology.

This legislation directed the State Board of Education and the Board of Higher Education (now the Board of Governors for Higher Education) to establish a Joint Committee on Educational Technology to advise both boards on the effective coordination and use of educational technology for Connecticut schools and colleges. The committee was charged to develop a long-range plan and recommendations pertaining to the coordination of educational technology for consideration by the respective boards on or before September 15, 1983.

In October 1982, the Joint Committee on Educational Technology was organized by both boards to consist of six regular and two ex officio members. The regular members included two members of the State Board of Education, two members of the Board of Higher Education and the commissioners of education and higher education. Ex officio members were appointed by the State Library Board and the Connecticut Educational Telecommunications Corporation Board.

Three task forces (see Appendix) were established by the Joint Committee in January 1983 to obtain the advice of those working on a daily basis with educational technology. Each task force included representatives of elementary and secondary schools, colleges, universities, business, industry and the general public.

- The **Task Force on Computers and Instruction** focused on the use of computers in the learning process with computer-assisted instruction and computer literacy as primary areas of concern.

- The **Task Force on Information Retrieval and Transfer** addressed the storage, management, communication and utilization of various information sources and data bases with special emphasis on the role of library media centers in information retrieval and transfer.

- The **Task Force on Instructional Television** examined the use of television in the instructional process with particular attention paid to the implications of open broadcast, cable and nonbroadcast utilization.

The three task forces met regularly for six months to debate issues related to the effective use of technology. All three groups concluded that a need exists for communication, cooperation and collaboration among educators at all levels, and members of the business, library and educational television communities if Connecticut students are to benefit from technological advances. To accomplish this, each task force recommended a mechanism to encourage appropriate coordination.

The Task Force on Computers and Instruction recommended a broad-based consortium on educational technology composed of representatives from elementary, secondary and postsecondary education, local and regional libraries, Connecticut Public Television, business and industry. The consortium would have fiscal autonomy and would be governed by a board of directors appointed by the governor. Members of the Task Force on Computers and Instruction felt that an independent consortium would have greater latitude in addressing educational technology issues and would avoid the competing pressures that a closer affiliation with existing agencies would provide.

The other two task forces recommended modifications in the original structure established under P.A. 82-266, emphasizing the need for adequate staff and continued advice from experts in the field. In addition to a structure which would ensure adequate coordination, the task forces issued recommendations calling for better planning, greater funding, stronger communication networks, strengthened resource sharing and pre-service and in-service training programs in educational technology for faculty at Connecticut schools, colleges and universities.

This report contains the Joint Committee on Educational Technology's recommendations for improving the delivery of education in Connecticut through technological means. These recommendations are based on those of the three task forces and on a review of the current use of educational technology in Connecticut (see "Status Reports" p. 11).

The recommendations rely upon a broad definition of educational technology as that aspect of education involved in enhancing learning through the systematic identification, organization, utilization and management of a full range of learning resources. The recommendations address not only hardware and software needs, but also the individual techniques and delivery systems needed to assure that technology can further Connecticut's educational goals. Both the use of technology as a learning tool and as a subject of study are addressed.

Recommendations

Recent revolutionary advances in technology promise extraordinary change in the method and delivery of instruction in Connecticut schools and colleges. While the new technologies will neither replace teachers nor make classrooms obsolete, they are causing educators across the state to re-think their traditional roles and to re-evaluate educational programs and standards in general.

With change comes opportunity. An overriding issue facing education in Connecticut is how to respond in a timely fashion to shape the opportunities presented by the technological revolution in a manner that best meets the needs of Connecticut students, educators, taxpayers and the state's economy.

In order to realize the full potential of educational technology, coordination and systematic planning are absolutely essential both within Connecticut's educational system and between it and other sources of instructional services. While individual and institutional initiatives are valuable and should be encouraged, the need for overall coordination remains vital. In addition, each school and school district should be prepared to engage in more rigorous planning and evaluation prior to any rapid acquisition of equipment and material.

This imperative to coordinate the use of educational technology has prompted formal action, of one sort or another, by virtually every state in the nation. Fourteen states have enacted legislation and 23 others have established statewide committees, divisions, centers or offices of technology. Over half have set up task forces, committees or commissions to study and/or develop policies and recommendations pertaining to the use of educational technology. While state approaches vary tremendously, the logic behind each effort is the same: to ensure the efficient and effective use of educational technology through coordination and systematic planning.

The primary purpose of this plan by the Joint Committee on Educational Technology is to help harness technology and its use where appropriate and effective in improving student learning opportunities at all levels of education in Connecticut.

The recommendations of the Joint Committee which follow address the need for effective coordination in Connecticut. They are organized into four sections: Coordination, Information, Leadership and Training.

COORDINATION

The Joint Committee recommends that the following structure and procedures should be utilized to ensure appropriate coordination.

1. The Joint Committee on Educational Technology shall continue to be the coordinating mechanism for educational technology. Membership shall continue to consist of two members of the State Board of Education, two members of the Board of Governors for Higher Education and the commissioners of education and higher education. Current nonvoting representatives of the State Library and the Connecticut Educational Telecommunications Corporation shall be made full voting members.

2. The Joint Committee shall meet regularly and no less than twice annually to consider policy recommendations regarding the use of educational technology. Such policy recommendations shall be referred to the State Board of Education and the Board of Governors for Higher Education for action.

3. The Joint Committee shall appoint an advisory committee for assistance in recommending coordination and specific implementation activities needed to ensure the most effective and efficient use of educational technology. Ad hoc committees or subcommittees may be appointed for guidance on specific technological issues. Both the State Department of Education and the Department of Higher Education should continue to solicit regular input from their respective constituencies.

4. The State Department of Education and the Department of Higher Education shall have staff to implement the policies on educational technology approved by the State Board of Education and the Board of Governors for Higher Education. At least one staff person with expertise in the use of educational technology shall be hired by the Department of Higher Education. Staff from both agencies shall work in concert to ensure effective coordination.

5. In addition to state funds, grants shall be sought by the State Department of Education and Department of Higher Education from public and private sources, business and industry to support specific activities.

6. The Joint Committee regularly shall review progress made under the organizational structure outlined above in achieving the goals of its original legislative mandate and shall prepare annual reports to the State Board of Education and the Board of Governors for Higher Education.

INFORMATION CLEARINGHOUSE

The Joint Committee recommends that the following structure and activities should be developed and carried out to make readily available information regarding the use of educational technology:

7. There shall be a permanent statewide clearinghouse for information related to educational technology sponsored jointly by the State Department of Education and the Department of Higher Education. Specific functions of the clearinghouse shall include:

   - conducting statewide **needs assessments** to determine the technical assistance needs of Connecticut schools, colleges and universities;
   - **cataloging** of state resources and activities in all areas of educational technology;
   - stimulating **networking** between higher education, elementary and secondary schools, regional centers and other institutions to encourage sharing and dissemination of successful practices;
   - developing **guidelines** for the acquisition of hardware and software;
   - promoting **cooperative purchasing** and master agreements for the purchase of hardware and software;
   - providing statewide **reproduction** and utilization services for computer software and video programs in accordance with copyright laws;
   - encouraging the utilization of **uniform standards for bibliographic data** and storage as well as for the conversion of existing library records into machine readable form;
   - aiding in the developing of a **statewide bibliographic data base** containing information about the holdings of all libraries in Connecticut;
   - encouraging **cooperative program developing and acquisition** of televised and/or computerized instruction; and
   - assembling a **collection of evaluations and reviews** of instructional hardware and software.

8. The resources of the State Department of Education and the Department of Higher Education shall be pooled and funding from private foundations and business shall be sought to support the clearinghouse. Consideration shall be given to contracting for the statewide clearinghouse based on a competitive proposal process.

LEADERSHIP

The Joint Committee recommends the following policies should be implemented to provide for effective leadership in coordinating the use of educational technology in Connecticut.

9. The State Board of Education and the Board of Governors for Higher Education shall develop policies and guidelines to assure that all students have access and exposure to the learning opportunities presented via technology, and to encourage the appropriate and effective use of technology in the delivery of education by all disciplines at all levels. Both boards shall seek adequate funding to assist in implementing such policies and guidelines.

10. The State Department of Education shall develop by June 1984 state guidelines for computers in education and shall identify common and successful models of the educational use of computers for dissemination among Connecticut schools.

11. The State Board of Education and the Board of Governors for Higher Education shall work to encourage evaluation and research activities related to assessing the instructional effectiveness of the computer and other technologies.

12. The State Board of Education and the Board of Governors for Higher Education shall strongly encourage each local school district and public institution of higher education to develop as soon as possible, and by January 1985 at the latest, a comprehensive long-range plan to be updated as necessary on the use of computers. Based on state guidelines, these plans shall include goals, objectives and strategies for implementation and evaluation. They also shall describe staff training efforts and proposals for fiscal support.

    Furthermore, both boards shall urge each local district and institution to base its acquisition of hardware and software on

these plans, as well as on a careful review of potential short- and long-term benefits and costs.

13. The State Board of Education and the Board of Governors for Higher Education shall encourage regional and statewide partnerships between business, industry and education to stimulate the effective use of educational technology, including the development of exemplary models. Regional cooperative efforts between local education agencies and institutions of higher education also shall be encouraged.

14. The State Board of Education and the Board of Governors for Higher Education shall develop funding proposals and other incentives for institutional initiatives and participation in regional cooperative programs.

15. The State Board of Education and the Board of Governors for Higher Education shall encourage the incorporation into the curricula of Connecticut schools, colleges and universities instruction in locating and using information. *A Guide to School Library Media Programs*, compiled in 1982 by the State Department of Education, would be an important resource at the elementary and secondary school levels.

16. The Joint Committee shall recommend delivery systems for instructional television and shall establish priorities for allocating time on cable, as required under P.A. 83-584, and other appropriate delivery systems.

17. The State Board of Education and the Board of Governors for Higher Education shall explore methods for the electronic storage, access and distribution of information.

18. The State Board of Education and the Board of Governors for Higher Education shall work to ensure articulation and continuity in computer education programs.

19. The State Board of Education shall consider including computer literacy in its list of offerings for elementary and secondary schools and in developing high school graduation requirements.

20. The Joint Committee shall investigate with appropriate agencies, the process and requirements for awarding school and college credit for courses of study pursued via technology to ensure that instructional quality and standards are maintained.

TRAINING

The Joint Committee recommends the following policies should be implemented to strengthen the competency of teachers and administrators in the use of educational technology.

21. Educational technology and its uses shall be required components of all teacher education programs. Faculty in teacher preparation programs shall demonstrate competencies in educational technology, including computers.

22. The State Board of Education shall establish a requirement that, to be eligible for teacher and administrative certification, an individual must be able to demonstrate ability to use educational technology, including computers, to improve learning.

23. The State Board of Education shall include as part of its ongoing consideration of renewable teacher certification, the development of a plan to assure appropriate in-service training opportunities, specifically in the fields of educational technology and computers, for current teachers and administrators. The Board of Governors shall encourage training in the use of educational technology, including computers, for postsecondary faculty.

Status of Technology in Connecticut

The use of educational technology in Connecticut schools is growing and the potential for new applications abounds for computers as a learning aid, for technology to provide library media services and for instructional television. The status of each of these is described in the sections that follow.

COMPUTERS AND INSTRUCTION

With the emergence of the "chip" and development of the microcomputer, computer technology has experienced exponential growth in recent years. Schools and colleges in Connecticut have been involved with computer technology for two decades. The availability of increasingly sophisticated computers at reasonable cost has been responsible for their growing use in education.

The most recent survey conducted in 1982 by the State Department of Education indicates an estimated 4,000 computers, mostly microcomputers, are in use in public elementary and secondary schools with the number increasing rapidly. Thirty-five percent of those school districts responding reported district-wide plans to implement computer technology in school programs. Local school systems also have mainframe or minicomputers that are used primarily for administrative functions.

In many instances, schools and colleges are linked to national or regional computerized data bases. For example, the Guidance and Information Service (GIS), a computerized guidance information system operated out of the New Haven-based Area Cooperative Education Service (ACES), has more than 200 users across Connecticut, including eight colleges, with the remainder being primarily public secondary schools.

Schools use computers to broaden computer literacy among students, to aid in the instruction of traditional courses and for vocational purposes. Increasing numbers of schools are including computer literacy as part of their general education. For instance, each of the 17 Connecticut regional vocational-technical schools has established computer laboratories and require computer instruction for ninth grade students. Increasing numbers of schools, too, are using the computer as an instructional resource in every curriculum area through the use of software for drill and practice, information retrieval and as a problem-solving tool. No longer is computer use confined

to academically talented students in high school mathematics departments. Computers are now used by a growing number of students of all ability levels and ages and in a variety of curriculum areas. Particularly within the fields of business education and industrial arts, students are learning computer skills in word processing and microcomputer repair which can be used in entry-level positions in business and industry.

Currently, computer technology is not a part of pre-service program requirements for teachers. In-service training of staff is addressed inadequately, for the most part, by a small number of college courses, summer workshops, vendor awareness sessions and programs designed by local school districts. Expanding the computer literacy of college faculty in all disciplines is becoming an increasingly critical concern.

Within local school districts, local education agencies (LEAs) use vocational education equipment grants to purchase microcomputers and related software. More than 90 percent of the LEAs have one or more microcomputers in their vocational programs. Exemplary, research and curriculum funds are provided to the LEAs to develop a computer literacy curriculum for vocational students; to write, test and disseminate computer-assisted instruction for accounting students; to provide keyboarding instruction to seventh grade students; and to sponsor workshops for LEA vocational education teachers in the use of microcomputers. Adult education directors are given information and can participate in workshops to assist them in providing courses in computer literacy, and in using the State Occupational Information Coordinating Committee's Career Information System.

The State Board of Education in November 1981 endorsed a policy statement that emphasizes the importance of computer technology in improving education in Connecticut's elementary and secondary schools. The Department of Education has hired a consultant for computer technology in its Bureau of Curriculum and Staff Development's Learning Resources and Technology Unit, and has held two statewide colloquia on the instructional use of the computer for teachers, principals and superintendents from public and private schools. The Department also publishes a newsletter, has distributed six publications on such issues as literacy and software and hardware evaluation, provides consultative services to schools, and works with an advisory committee to create and review activities to meet the computer technology needs of elementary and secondary schools.

In addition, the Department has subscribed to the Minnesota Education Computing Consortium (MECC) by purchasing an institutional membership that permits all elementary and secondary schools in the state to have access to MECC software at a reasonable price. As a member of the MICROsift network out of the Northwest Regional Laboratory in Portland, Oregon (a federally funded national software evaluation project), the Department receives copies of and participates in all software evaluations. The Department also is active in the Northeast Regional Exchange (NEREX) as a member of the computer task force of the seven-state consortium. Two

members of the Department serve on a steering committee of the Agency for Instructional Television (AIT) which is developing exemplary computer software programs. A Connecticut elementary teacher is a part of the writing team.

The Board of Higher Education's efforts in expanding the use of computer technology at the college level have centered on the responsiveness of postsecondary computer education programs to growing industry and student demand. In May 1982, the commissioner of higher education appointed faculty and representatives of business and industry to a special advisory committee to review computer education programs offered at Connecticut public and independent institutions of higher learning. The results of their statewide study, published in February 1983, showed that Connecticut's colleges are producing too many graduates with entry-level computer skills such as data processing, and too few with training in more advanced fields such as computer engineering. The advisory report calls for a re-evaluation of existing certificate and associate degree programs in data processing, expansion of programs in areas of shortage, greater promotion of computer literacy among all students, and strengthened efforts by business and higher education to integrate co-op or work/study computer programs in college curricula. The committee's findings and recommendations are referred to by institutions and Department of Higher Education staff in developing and reviewing new and existing computer education programs.

Generally in higher education, little has been done to improve systematically the computer literacy of students. The major focus has remained in professional and data processing or computer science programs. Mainframe computers have been used primarily for problem solving, statistical analysis and research by departments of mathematics, science and engineering. The use of the microcomputer is very limited, and has occurred generally as a consequence of individual faculty initiative rather than systematic institutional application.

INFORMATION RETRIEVAL AND TRANSFER

Given the explosion of knowledge in virtually every field, education can no longer be measured by what one knows, but rather by what one can access. One of the largest and most immediate collections of information available to students can be accessed through the state's public and college libraries.

The computer is a valuable tool for accessing information and is used in a variety of ways in the library world. First, computerized circulation systems can be used to assist with acquisitions, circulation, overdue notices

and interlibrary loans. The GEAC system is a commercial, computerized circulation system used by many Connecticut libraries. National network services also can be used for ordering, cataloging and interlibrary loans. The On-Line College Library Center (OCLC) is one of the major national providers of such services.

Computerized library networks allow participating libraries to pool their resources. Four such library networks in Connecticut currently or soon will provide data on the availability of information in participating libraries: Bibliomation in Fairfield County, CircCess in Hartford County, Libraries on Line (LION) in southeastern Connecticut and Library Exchange Aids Patrons (LEAP) in Hamden and Cheshire.

In addition to computerized systems for acquisitions, cataloging and circulation, computerized access to national information bases has become an essential element of library services. Both commercial and noncommercial national information retrieval services are available which provide access to specific data bases. Commercial information retrieval systems include Bibliographic Retrieval Service (BRS), Lockheed's Dialog, The New York Times Information Bank and The Source. Noncommercial information bases include the Government Printing Office (GPO) and the National Library of Medicine (NLM). Such information systems usually are accessed via a telephone line and are searched using key words or phrases. There is generally a fee for using the service and a per-item charge.

Despite the wide availability of computerized circulation and network services, computerized access to the records of Connecticut public and academic libraries is limited. The state's 195 public libraries with 9.5 million books, and college and university libraries with 14.4 million books, house a total of 23.9 million volumes. This statewide bibliographic resource is broken down into over 250 individual data bases, each maintaining a separate manual card catalog which provides subject, author and title access to its own collection.

Of the 1,011 public schools in Connecticut, nearly all have some collection of print and/or nonprint materials. Retrieval of information in these collections is primarily through the manual use of printed card catalogs. Computer use by public school libraries is minimal and no schools are involved in any of the four library circulation networks currently active in the state. Instruction in locating and using resources varies widely among school districts. Additional print and nonprint materials are available for elementary and secondary school use at the six regional educational service centers, six cooperating library service units (CLSUs) and two state library service centers.

Efforts to expand access beyond the state are unsystematic and generally confined to the initiative of individual library groups or schools. The Southwestern Connecticut Library Council recently subscribed to the Bibliographic Retrieval Service (BRS) together with 16 public, academic, school

and special libraries. Although this national data base serves primarily for reference and research, it is used also by senior high school students for training in advanced research skills. Moreover, 15 school systems and/or regional educational service centers will soon become participants in CONNections, an electronic information network accessed via microcomputers. CONNections provides access to The Source and Education USA national data bases.

Information transfer and delivery remains largely a manual process. The State Library operates a van delivery service, Connecticar, among public and academic libraries and cooperating library service units. Connecticar facilitates interlibrary loans among libraries and the State Interlibrary Loan Center in Hartford. Many school systems have intra-district delivery systems or vans to regional educational service centers but are not included in the Connecticar delivery system.

A variety of services exist in the state to coordinate access to information resources. Consultants employed by the State Department of Education and the State Library work with school library media specialists and librarians in the area of library media services, instruction and automation.

Seventeen of Connecticut's 48 colleges and universities subscribe to national network services to acquire and catalog materials. The most popular network service is the OCLC which allows libraries to locate materials in the 3,000 member libraries worldwide.

The Storrs campus and three branches of the University of Connecticut and its Health Center use OCLC for cataloging, acquisitions, interlibrary loan and verification activities. Each of the four state universities also utilizes some elements of OCLC. Central Connecticut State University uses OCLC for cataloging and some interlibrary loans, Eastern Connecticut State University for acquisitions and interlibrary loans, and Southern and Western Connecticut State Universities for acquisitions, cataloging and loans.

Only one community college utilizes a computerized system for cataloging and acquisitions in association with the Eastern Connecticut Library Association, one of the state's six CLSUs. The state technical colleges have no computer capacity and do not subscribe to any information system.

Eleven of Connecticut's independent colleges subscribe to OCLC. Yale subscribes to the Research Libraries' Group/Research Library Information Network (RLG/RLIN), a system built to support the bibliographic needs of major research libraries in the United States.

Two computerized circulation systems are in use in Connecticut higher education. One college has a system that was developed in house, while ten others utilize the GEAC system. Colleges using GEAC usually share common hardware and software with several other users and purchase the

necessary peripheral equipment to operate the system at their own institutions.

The University of Connecticut Health Center participates in a GEAC computerized circulation system with four community colleges, three independent colleges and 15 public libraries in the Capitol Region Library Council CircCess group.

The University of Connecticut at Storrs presently relies upon an in-house circulation system developed in 1973, through which information is accessed via a manual, on-site card catalog. The University is in the process of implementing a comprehensive system which is expected to replace the traditional card catalog. The on-line catalog will be accessed through terminals in the library as well as at other selected locations via video cable. Since it is a turnkey system, a number of functions can be accomplished using the one system, including on-line reserve, acquisitions and serials check-in.

A special interlibrary loan teleprinter system, funded by the Connecticut State Library, supports interlibrary communications between Connecticut College, Trinity College, the University of Connecticut, Wesleyan University and Yale University. The Yale University libraries alone house over 7.7 million volumes, or more than half of the entire academic book stock in Connecticut. Four of the college and university libraries pay an annual flat fee for books borrowed from Yale. Public libraries in Stamford, New Britain, Hartford, Bridgeport, Greenwich and Groton also participate in this network.

Connecticut State University does not have a computerized circulation system, nor the funds to install such a system. The Central Connecticut State University library has a semi-computerized system which utilizes punched cards to produce printouts and overdue notices. It is not now accessed by a terminal.

Four community colleges participate in the Capitol Region CircCess group. Two additional community colleges are in the process of identifying vendors to install computerized circulation systems.

Three independent institutions, the Hartford Graduate Center, St. Joseph College and the University of Hartford, are members of CircCess. Fairfield University shares a GEAC circulation system with ten public libraries in the Southwestern Connecticut Library Council, another of the state's six CLSUs. The system, referred to as Bibliomation, is parallel to CircCess in the Capitol Region Library Council. While the two systems are not linked, the potential for merger does exist. Yale University also uses a GEAC circulation system but is not linked into either CircCess or Bibliomation. Yale is considering circumventing the manual card catalog completely by moving to a direct user access system.

Many colleges and universities subscribe to national information bases. The University of Connecticut subscribes to BRS, Dialog and NLM. The University of Connecticut Law School has access to LEXIS, a law-oriented information retrieval system, while the University of Connecticut Health Center subscribes to Medline. The latter institution also uses the Programmed Logic Automated Teaching Organization (PLATO), an on-line tutorial used for patient simulation.

Access to national information data bases at the Connecticut State University is increasing. Central and Western Connecticut State Universities began subscribing to BRS in the fall of 1983, and Dialog is available at Southern and Western Connecticut State Universities. Southern also uses Medline for specific instructional purposes. Only two community colleges subscribe to a national information system. Four independent colleges subscribe to BRS and Dialog while two subscribe only to Dialog.

INSTRUCTIONAL TELEVISION

Over the years, instructional television for elementary and secondary schools has evolved from a service provided solely by Connecticut Public Television (CPTV) with funds from local school districts, to a service provided by the State Board of Education in cooperation with the Connecticut Educational Telecommunications Corporation (CETC), the parent company of CPTV and Connecticut Public Radio. Grants received from the Connecticut General Assembly provide approximately 22 percent of the CPTV annual budget to support broadcast operations. An annual agreement between the State Board of Education and CPTV supports the broadcast of at least 400 hours of instructional television for elementary and secondary schools. The Board directs funds from its budget to multistate consortia to develop and provide utilization rights for the programs included in its instructional television schedule.

In 1980, the Board established the Learning Resources and Technology Unit within its Division of Elementary and Secondary Education's Bureau of Curriculum and Staff Development. This unit is responsible for a broad area of technology including school library media programs, instructional television and computers in education.

In response to legislation passed by the Connecticut General Assembly, the Board in 1981 assumed full responsibility for instructional television services for Connecticut schools. Since then, the Board has provided approximately 400 hours of instructional television programs for elementary and secondary schools. The 1982-83 schedule offered instructional television programs from 10:00 A.M. to 12:00 P.M. and from 1:00 to 1:30 P.M. each day of the school year. There are 50 series in the schedule covering all curriculum areas and grade levels.

In 1982, legislation was passed mandating that all cable franchises in Connecticut offer free service to schools and libraries. The use of cable television as an instructional tool promises to be augmented further based on legislation enacted last spring requiring community antenna television companies to provide channel capacity for instructional programs as part of their basic service. Responsibility for coordinating the utilization of these instructional channels rests with the Joint Committee on Educational Technology.

Several cooperative efforts are underway between local school districts, regional agencies and other states to provide instructional television services in Connecticut. For example, each school district can participate at no cost in instructional services. Programs, instructional television schedules and resource guides are available from the State Department of Education. In addition, Department staff can assist in in-service and utilization workshops as needed by the districts. To strengthen communication with the local school districts, each school superintendent has identified a contact person within his or her district who serves as the district's primary link with the Department's Learning Resources and Technology Unit. These individuals distribute instructional television materials, provide feedback on programs and coordinate requests for instructional television services.

The Department also has undertaken various activities with regional agencies in Connecticut to facilitate the use and distribution of instructional television programs. These efforts include a video duplication service, cable casting of instructional programs, regional workshops and distribution of print materials. For example, the Capitol Region Education Council (CREC) provides a video duplication service, and Cable RAVE telecasts instructional television programs to Wallingford, Meriden, Southington and Cheshire on a schedule which differs from the CPTV broadcasts.

Outside Connecticut, the Department works closely with the Eastern Educational Network (EEN) and the six New England states regarding the utilization and scheduling of instructional television. In addition, the Department shares information regularly with other states on the use of satellite communications and new program developments in instructional television. CPTV also operates a receive/send satellite transmitting system which enhances regional utilization.

In higher education, the use of instructional television has grown significantly. One encouraging factor has been the recent recommendation by the Governor's Commission on Higher Education and the Economy for a telecommunications master plan at each level of the public higher education system. Another important factor has been the rapid development of cable television in the state which has allowed for expanded coverage and a variety of educational applications. Currently, over 500,000 households in Connecticut subscribe to cable and this number is increasing rapidly, making Connecticut one of the most densely wired states in the country.

Community colleges, particularly concerned with expanding access, have been at the forefront of instructional television use. Founded in 1983, the TV Community College telecourse program is a consortium of all 12 community colleges which offers credit courses on CPTV and educational access channels on 12 cable systems statewide. During the past decade, over 50 courses have been offered to more than 11,000 students.

The program is designed to provide access to higher education for persons who would normally be precluded from participation by personal circumstances. It is administered by the central office staff of the Board of Trustees for the Regional Community Colleges who procure, coordinate and advertise campus offerings, conduct student research and develop print materials. Course evaluation and selection and other general academic functions are carried out by the TV Community College's Coordinating Committee.

To expand the availability of television courses for the working adult population, the TV Community College began using cable educational access channels on a few cable systems in 1978. The utilization of cable by the TV Community College has now grown to the 12 largest of the 24 systems throughout the state, and includes cable systems in the Greater Hartford, New Britain, New Haven, Middletown and Torrington areas. A videotape duplication center has been created at the AV/TV Center of Manchester Community College to serve this expanded cable network. Thirty-two hours of cable programming are duplicated each week and are distributed to the 12 cable systems.

TV Community College and CPTV recently completed plans for a three-phase Instructional Television Fixed Service (ITFS) microwave network. The ITFS will enable a new Community College Instructional Television Network to be broadcast by microwave transmission directly from the TV Community College Center in Hartford via CPTV to cable companies throughout the state.

The first phase of this new network was inaugurated in September 1983 and serves the Hartford, Middletown, Meriden, Waterbury and Torrington areas. It operates 12 hours daily with telecourses, programs in leisure-time skills, programs produced by the University of Connecticut and Talcott Mountain Science Center, and programs from the CPTV schedule. Later phases will extend the network to New Haven, Bridgeport and the rest of the state.

In addition to reaching prospective students at home via cable, the ITFS broadcast microwave network can be received by businesses and institutions which have appropriate receiving equipment. This enables the Community College Instructional Television Network to provide this segment of the community with instructional and training services now offered to them on two videocassette networks.

With its large resources, the University of Connecticut also has been active in the provision of instructional television services. The University of Connecticut Center for Instructional Media and Technology (UCIMT) at Storrs is the hub of an elaborate one-way video and two-way audio microwave system which serves all of the University's branch campuses. The microwave system is used during the day and evening for undergraduate and graduate courses, providing educational opportunities to individuals statewide. The University's Division of Extended and Continuing Education utilizes the system to provide professional educational services and to meet retraining needs. The microwave system also has functioned as a teleconferencing facility for state and campus organizations.

UCIMT's Telecommunications Division provides weekly outreach and public service programs to 12 cable television outlets in Connecticut and Massachusetts. These programs soon will be available to a nationwide cable television network via a communication satellite. The Division recently was awarded a Connecticut Humanities Council grant to research and script a television documentary on Irish heritage in Connecticut. Finally, the Division has submitted a grant proposal to the Corporation for Public Broadcasting/Annenberg School of Communications Project, seeking $540,000 to produce 13 half-hour television tapes on the topic of food and the world's population.

Another example of the current use of television as an instructional tool is occurring at Waterbury State Technical College, which has a television laboratory in its skills center. The lab is used by students who tape and evaluate oral presentations prior to classroom delivery.

While the state's independent institutions of higher education have not been particularly active in the field of telecommunications, three notable exceptions are Fairfield University, the University of Bridgeport and Quinnipiac College.

Pioneer efforts at Fairfield University have made it the first institution in the state to offer an educational television program for credit and to broadcast programs on the air on a regular basis. Fairfield's Education Technology Program prepares teachers and administrators in a wide range of instructional technology applications, including comprehensive training in television. In addition, Fairfield University houses the only Graduate School of Communications in the state.

For more than a decade, the University of Bridgeport has provided educational and public broadcast services to the greater Bridgeport area through its Cable Television Corporation and WUBC-TV. The staff of this service produces and coordinates live and rebroadcast videotape productions of music, debates, lectures, movies and general features. Plans are underway to include a satellite feed and a modern educational series involving local business and industry.

During the past year at Quinnipiac College, advanced students and faculty in its mass communications program and in its audiovisual services area have begun producing public service programs which will be offered to cable companies in the state in 1984. These programs, which are approximately 30 minutes in length, also will be available to other agencies and nonprofit organizations.

Finally, several Connecticut-based corporations have become leaders in both corporate training and commercial telecommunications and national teleconferencing through their satellite business systems. The new Aetna Institute Corporate Training Center will be a model in the nation in the use of telecommunications technology for instruction and training.

Appendix

Task Force Members

The Joint Committee gratefully acknowledges the outstanding advice and counsel provided by the many individuals who served on the Committee's three task forces. The Joint Committee particularly wishes to thank the chairmen of the task forces who gave so generously of their time, effort and leadership in guiding this project forward.

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